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DEPARTMENT OF THE ARMY TECHNICAL BULLETIN

CALIBRATION PROCEDURE FOR MULTIMETER, ME-26( )/U AND HEWLETT-PACKARD MODELS 410B, 410BR, AND 410C

Headquarters, Department of the Army, Washington, DC
8 February 1985

REPORTING OF ERRORS

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*This bulletin supersedes TB 11-6625-200-35, 21 June 1976, and TB 9-6625-046-35, 4 September 1979, including all changes.

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SECTION I

IDENTIFICATION AND DESCRIPTION

1. Test Instrument Identification. This bulletin provides instructions for the calibration of Multimeter, ME-26 ( )/U and Hewlett-Packard, Models 410B, 410BR, and 410C. The manufacturer's manuals and TM 11-6625-200-15 were used as the prime data sources in compiling these instructions. The equipment being calibrated will be referred to as the TI (test instrument) throughout this bulletin.

a. Model Variations. Variations among models are described in text.

b. Time and Technique. The time required for this calibration is approximately 2 hours, using the dc and low frequency technique.

2. DA Form 2416 (Calibration Data Card)

a. Forms, records, and reports required for calibration personnel at all levels are prescribed by TB 750-25-1. DA Form 2416 must be annotated in accordance with TB 750-25-1 for each calibration performed.

b. Adjustments to be reported on DA Form 2416 are designated (R) at the end of the sentence in which they appear. When adjustments are in tables, the (R) follows the designated adjustment. Report only those adjustments made and designated with (R).

3. Calibration Description. TI parameters and performance specifications which pertain to this calibration are listed in table 1.

Table 1. Calibration Description

Test instrument parameters	Performance specifications
Multimeter ME-26( )/U and Hewlett-Packard, Models 410B and 410BR	
Dc voltage	Range: 0 to ±1000 V[1] Accuracy: ±3% FS
Ac voltage	Range: 0 to 300 V[2] Accuracy: ±3% FS at 400 Hz
Frequency response Models 410B, 410BR ME-26( )/U	Referenced to 400 Hz: ±1 dB; 20 Hz to 700 MHz[3] ±1 dB; 20 Hz to 300 MHz[3] ±3 dB; 300 to 700 MHz[4]
Resistance	Range: 0 to 500 MΩ Accuracy at mid-scale: ±1Ω on RX1 range ±5% on all other ranges
Hewlett-Packard, Model 410C	
Dc voltage	Range: 0 to ±1500 V[5] Accuracy: ±2% FS
Ac voltage	Range: 0 to 300 V Accuracy: ±3% FS at 400 Hz

See footnotes at end of table.

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Table 1. Calibration Description - Continued

Test instrument parameters	Performance specifications
Frequency response	Referenced to 400 Hz: ±10%; 20 to 100 Hz ±2%; 100 Hz to 50 MHz ±4%; 50 to 100 MHz ±1.5 dB; 100 to 700 MHz[3]
Resistance	Range: 0 to 500 MΩ Accuracy: 0 to midscale: ±5% of reading or ±2% of midscale, whichever is greater. ±7% from midscale to scale value of 2. ±8% from scale value of 2 to 3. ±9% from scale value of 3 to 5. ±10% from scale value of 5 to 10.
Dc current	Range: 0 to ±150 mA Accuracy: ±3% FS

[1]Range extended to 30 kV with use of dc divider supplied with TI. Accuracy of dc divider is ±5%.

[2]Range extended to 2000 V with use of capacity divider supplied with TI. Accuracy of capacity divider is ±1%.

[3]Not verified above 100 MHz.

[4]Limit specified in letter, AMSEL-ME-NMP-TE-3, dated 1 March 1968.

[5]Not verified above 1000 V dc.

SECTION II

EQUIPMENT REQUIREMENTS

4. Equipment Required. Table 2 identifies the specific equipment to be used in this calibration procedure. This equipment is issued with Secondary Transfer Calibration Standards Set, AN/GSM-286. Alternate items may be used by the calibrating activity when the equipment listed in table 2 is not available. The items selected must be verified to perform satisfactorily prior to use and must bear evidence of current calibration. The equipment must meet or exceed the minimum use specifications listed in table 2. The accuracies listed in table 2 provide a four-to-one ratio between the standard and TI. Where the four-to-one ratio cannot be met, the actual accuracy of the equipment selected is shown in parenthesis.

5. Accessories Required. The accessories listed in table 3 are issued as indicated in paragraph 4 above and are used in this calibration procedure. When necessary, these items may be substituted by equivalent items, unless specifically prohibited.

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Table 2. Minimum Specifications of Equipment Required

Item	Common name	Minimum use specifications	Manufacturer and model (part number)
A1	AC CALIBRATOR	Range: 0 to 315 V ac at 400 Hz, 891 to 909 V ac at 10 kHz Accuracy: ±0.75%	Hewlett-Packard, Model 745AOPTC93 (745AOPTC93) w/HV amplifier C90-746A (C90-746A)
A2	AUTOTRANSFORMER	Range: 105 to 125 V ac Accuracy: ±1%	General Radio, Model W10MT3AS3 or Ridge, Model 9020F (7910809)
A3	DC CURRENT SHUNT	Range: 0 to 150 mA Accuracy: [1]	Guildline, Model 9711 (7912323)
A4	DC POWER SUPPLY	Range: 0 to 150 mA	NJE, Model CS36CR30D2 (7907346-2)
A5	DC VOLTAGE STANDARD	Range: 0 to 1030 V dc Accuracy: ±0.5%	John Fluke, Model 332B/AF (332B/AF)
A6	DECADE RESISTOR	Range: 0 to 500,000Ω	Winslow, Model 336 (7907234)
A7	DIGITAL VOLTMETER	Range: 4.9 to 6.4 V ac 0 to 51.5 mV dc Accuracy: [1]	Hewlett-Packard, Model 3490AOPT060 (3490AOPT060)
A8	POWER METER	Frequency range: 10 to 100 MHz Accuracy: ±0.5% (1%)	Hewlett-Packard, Model E12-432A (MIS-30525) w/ thermistor mount, Hewlett-Packard, Model H75-478A (7915907) or 8478A
A9	RESISTANCE STANDARD	Range: 0 to 10.5 MΩ Accuracy: ±1.25%	Biddle-Gray, Model 601147-1 (7910328)
A10	RESISTANCE STANDARD	Range: 1 to 10 MΩ Accuracy: ±1.25%	ICC, Model CR10M (8598965)
A11	SIGNAL GENERATOR	Frequency range: 10 to 100 MHz Amplitude: 0.9 V ac	Hewlett-Packard, Model 8640B-OPTH66 (MIS-28707 Type 1)
A12	TEST OSCILLATOR	Frequency range: 20 Hz to 10 MHz Amplitude: 0.9 V ac Leveling: ±0.5%	Hewlett-Packard, Model 652A (MIS-10224)

[1]Combined accuracy of A3 and A7: ±0.75%.

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Table 3. Accessories Required

Item	Common name	Description (part number)
B1	ADAPTER	ENC plug to double banana jacks (7909401) (UG1441/U)
B2	ADAPTER[1]	Single banana jack to spade lug (red) (7907502-2)
B3	ADAPTER	410C Probe-T, Hewlett-Packard, Model 11042/ 455A (8899531)
B4	ADAPTER BOX	SKD-4850-3 (7916113)
B5	CABLE	30-in., RG-58/U; double banana plug terminations (7907470)
B6	CABLE	36-in., RG-58/U; BNC plug to double banana plug terminations (7907471)
B7	LEAD[1]	24-in., No. 18; single banana plug terminations (red) (7907497)
B8	TERMINATION	50Ω feed-through, BNC plug to BNC jack (11048C)
B9	TEST LEAD[2]	Single banana plug to test hook (SKC-4850-14 or 7916122)

[1]Four required.

[2]Two required.

SECTION III

CALIBRATION PROCESS FOR MULTIMETERS ME-26( )/U, AND HEWLETT-PACKARD, MODELS 410B AND 410BR

6. Preliminary Instructions

a. The instructions outlined in paragraphs 6 and 7 are preparatory to the calibration process. Personnel should become familiar with the applicable sections before beginning the calibration.

b. Items of equipment used in this procedure are referenced within the text by common name and item identification number as listed in tables 2 and 3. For the identification of equipment referenced by item numbers prefixed with A, see table 2, and for prefix B, see table 3.

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WARNING

HIGH VOLTAGE is used or exposed during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NOTE

Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manuals and TM 11-6625-200-15 for this TI.

NOTE

Unless otherwise specified, all controls and control settings refer to the TI.

NOTE

The FUNCTION and SELECTOR switches are functionally identical and will be referred to as the SELECTOR switch throughout this bulletin.

7. Equipment Setup

a. Remove protective cover from TI only when necessary to make adjustments. Replace cover after completing the adjustments.

b. Connect TI to autotransformer (A2).

c. Connect autotransformer to a 115-V ac source and adjust for 115-V ac output.

d. Set SELECTOR switch to - and RANGE switch to RX1 1V and allow at least 15 minutes for warmup.

e. Set SELECTOR switch to OFF and wait 30 seconds. If meter pointer does not indicate 0, adjust meter mechanical zero for 0 indication.

8. Dc Voltage

a. Performance Check

(1) Set SELECTOR switch to + and allow at least 5 minutes for warmup.

(2) Connect DC probe and COMMON lead together and adjust ZERO ADJ for 0 meter indication.

(3) Connect DC probe and COMMON lead to dc voltage standard (A5).

(4) Adjust dc voltage standard for a full scale indication on TI. If dc voltage standard does not indicate between 0.970 and 1.030 V, perform b below.

(5) Rotate autotransformer (A2) between 105 and 125 V, and repeat technique of (4) above.

(6) Adjust autotransformer to 115 V and repeat technique of (4) above, using settings listed in table 4. Dc voltage standard will indicate within limits specified.

NOTE

Perform (7) through (10) below only if dc voltage divider is supplied with TI.

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(7) Set RANGE switch to RX100 10V.

(8) Connect dc voltage divider to DC probe. Connect dc voltage divider and COMMON lead together and adjust ZERO ADJ for 0 meter indication.

(9) Connect dc voltage divider and COMMON lead to dc voltage standard.

(10) Adjust dc voltage standard for TI indication recorded in table 4. Dc voltage standard will indicate between 855.0 and 945.0 V.

b. Adjustments

(1) Adjust autotransformer to 115 V.

(2) Set dc voltage standard to 1.000 V.

(3) Adjust R32 CAL DC (fig. 1) for indication of 1 V (R).

Table 4. Dc Voltage and Tracking

Test instrument		Dc voltage standard indications (V dc)	
RANGE switch settings	Indications	Min	Max
RX1 1V	.6	.570	.630
RX1 1V	.2	.170	.230
RX10 3V	3.0	2.910	3.090
RX100 10V	1.0[1]	9.70	10.30
RX1K 30V	3.0	29.10	30.90
RX10K 100V	1.0	97.0	103.0
RX100K 300V	3.0	291.0	309.0
RX1M 1000V DC ONLY	1.0	970.0	1030.0

[1]After this check, and only if dc voltage divider is supplied with TI, set dc voltage standard to 9.0 V. Record TI indication (reference point) for use in (10) below.

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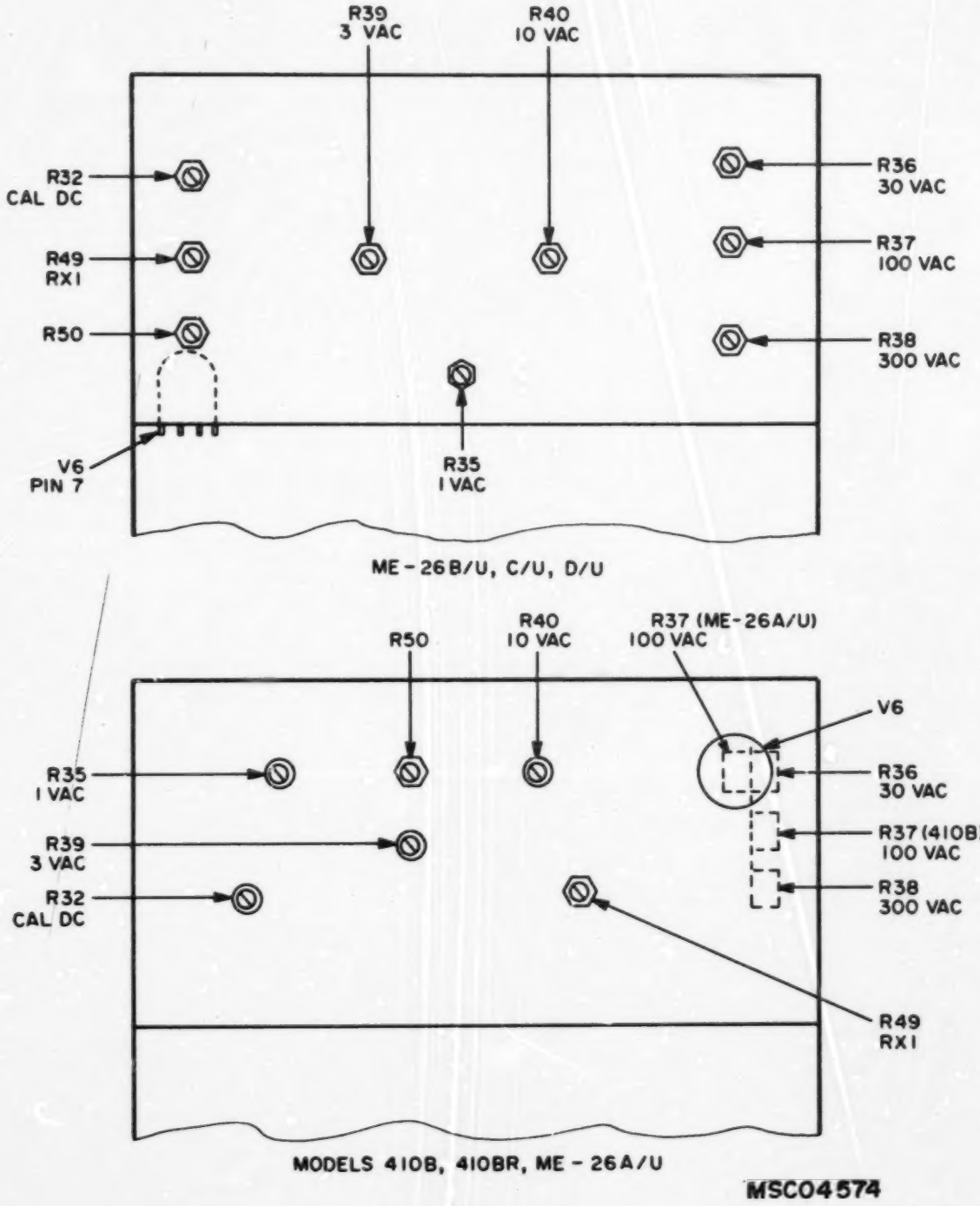

Figure 1. Adjustment locations - rear view.

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9. Ac Voltage

a. Performance Check

(1) Set SELECTOR switch to AC and RANGE switch to RX1 1V.

(2) Connect AC probe and COMMON lead together and adjust AC ZERO for 0 meter indication.

(3) Connect AC probe and COMMON lead to ac calibrator (A1), using adapter box and cable (B4 and B5).

(4) Adjust ac calibrator frequency for 400 Hz, and output for a full scale indication on TI. If ac calibrator does not indicate between 0.970 and 1.030 V, perform b below.

(5) Repeat technique of (4) above using settings listed in table 5. If ac calibrator does not indicate within specified limits, set ac calibrator to nominal value and perform adjustments listed in table 5 for full scale indication on TI.

Table 5. Ac Voltage and Adjustments

Test instrument		Ac calibrator indications (V ac)		Adjustments (fig. 1) (R)
RANGE switch settings	Indications	Min	Max	
RX10 3V	3	2.910	3.090	R39 3 VAC
RX100 10V	1[1]	9.70	10.30	R40 10 VAC
RX1K 30V	3	29.10	30.90	R36 30 VAC
RX10K 100V	1	97.0	103.0	R37 100 VAC
RX100K 300V	3	291.0	309.0	R38 300 VAC

[1]After this check, and only if capacitive voltage divider is supplied with TI, adjust ac calibration frequency to 10 kHz and amplitude to 9.0 V. Record TI indication (reference point) for use in (9) below. Readjust ac calibrator frequency to 400 Hz for remaining ranges.

NOTE

Perform (6) through (9) below only if capacitive voltage divider is supplied with TI.

(6) Set RANGE switch to R100 10V.

(7) Connect capacitive voltage divider to AC probe. Connect capacitive voltage divider and COMMON lead together and adjust AC ZERO for 0 meter indication.

(8) Connect capacitive voltage divider and COMMON lead to ac calibrator, using adapter box and leads.

(9) Adjust ac calibrator frequency to 10 kHz and amplitude for TI indication recorded in table 5. Ac calibrator will indicate between 891.0 and 909.0 V.

b. Adjustments

(1) Connect digital voltmeter (A7) between pin 7 of V6 (fig. 1) and ground, using test leads (B9). If digital voltmeter does not indicate between 4.9 and 5.1 V ac (for AC probe diode 2-01C) or 6.2 and 6.4 V ac (for AC probe diode EA53), adjust R50 (fig. 1) for 5 V ac or 6.3 V ac as applicable (R).

(2) Set ac calibrator to 1.000 V.

(3) Adjust R35 1 V ac (fig. 1) for indication of 1 V (R).

10. Frequency Response

a. Performance Check

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(1) Set RANGE switch to RX1 1V.

(2) Connect AC probe and COMMON leads together and adjust AC ZERO for 0 indication on TI.

(3) Connect AC probe and COMMON lead to test oscillator (A12) 50 ohm output, using adapter and termination (B1 and B8).

(4) Adjust test oscillator frequency for 400 Hz and amplitude for .3 V as indicated on TI.

(5) Set test oscillator EXPAND NORMAL switch to EXPAND and adjust REF SET for 0 indication on test oscillator.

(6) Adjust test oscillator frequency to 20 Hz, 100 KHz and 10 MHz. Adjust amplitude to maintain 0 indication on test oscillator. TI will indicate between .26 and .34 V.

(7) Record TI meter indication at 10 MHz.

(8) Connect equipment as shown in figure 2.

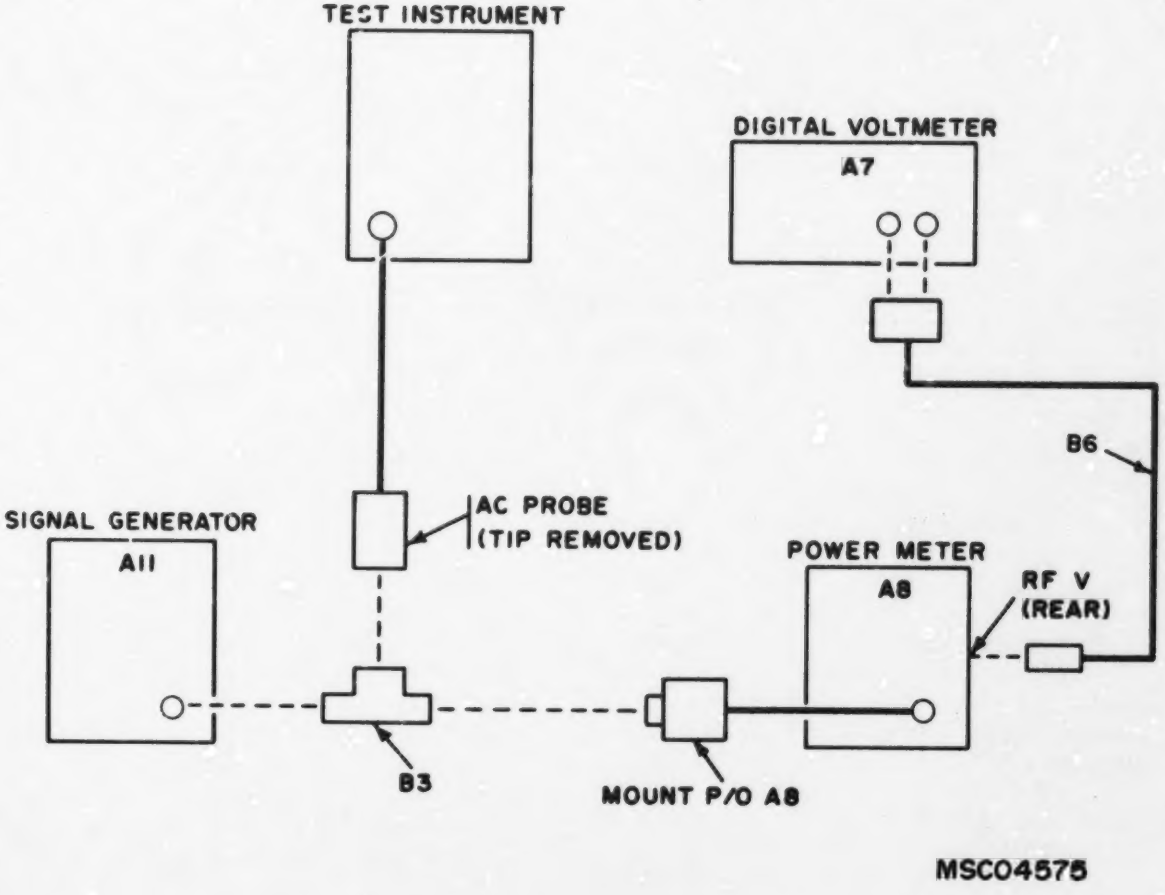

Figure 2. Frequency response - equipment setup.

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(9) Adjust signal generator (A11) frequency for 10 MHz and amplitude for same TI indication as recorded in (7) above. Record digital voltmeter (A7) indication.

(10) Adjust signal generator for 30, 50, and 100 MHz while maintaining digital voltmeter indication recorded in (9) above. TI will indicate between .26 and .34 V.

b. Adjustments. No adjustments can be made.

11. Resistance

a. Performance Check

(1) Set SELECTOR switch to OHMS.

(2) Adjust OHMS ADJ. for ∞ meter indication.

(3) Connect OHMS and COMMON leads together and adjust ZERO ADJ. for 0 meter indication.

(4) Separate OHMS and COMMON leads.

(5) Repeat (2) through (4) above until no further adjustment is necessary.

(6) Connect OHMS and COMMON leads to resistance standard (A9).

(7) Adjust resistance standard for 10 ohms indication on TI. If resistance standard setting is not between 9 and 11 ohms, perform b below.

(8) If no adjustment was necessary in (8) above, proceed to (9) below. If adjustment was necessary, repeat (2) through (7) above. Resistance standard setting will be between 9 and 11 ohms.

(9) Remove OHMS lead from resistance standard and repeat technique of (2) through (7) above for RANGE switch settings and indications in table 6. Resistance standard settings will be within limits specified in table 6.

Table 6. Resistance

Test instrument		Resistance standard indications	
RANGE switch settings	Indications (OHMS scale)	Min	Max
RX10 3V	10	95 Ω	105 Ω
RX100 10V	10	950 Ω	1050 Ω
RX1K 30V	10	9.5 kΩ	10.5 kΩ
RX10K 100V	10	95 kΩ	105 kΩ
RX1000K 300V	10	.95 MΩ	1.05 MΩ
RX1M 1000V DC ONLY[1]	10	9.5 MΩ	10.5 MΩ

[1]Connect resistance standard (A10) in series with resistance standard (A9), using lead (B7).

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b. Adjustments

(1) Remove OHMS lead from resistance standard and set RANGE switch to RX10 3V. Adjust OHM ADJ. for ∞ meter indication.

(2) Set RANGE switch to RX1 1V. Adjust RX1 R49 (fig. 1) for ∞ meter indication (R).

12. Final Procedure

a. Deenergize and disconnect all equipment and reinstall protective cover on TI.

b. When all parameters are within tolerance, annotate and affix DA Label 80 (US Army Calibrated Instrument). When the TI receives limited or special calibration, annotate and affix DA Label 163 (US Army Limited or Special Calibration). When the TI cannot be adjusted within tolerance, repair the TI in accordance with the maintenance manual. When repair is delayed for any reason or the TI cannot be repaired with local resources, annotate and affix DA Form 2417 (US Army Calibration System Rejected Instrument) and inform the owner/user accordingly in accordance with TB 750-25-1.

SECTION IV

CALIBRATION PROCESS FOR

MULTIMETER, HEWLETT-PACKARD, MODEL 410C

13. Preliminary Instructions

a. The instructions outlined in paragraphs 13 and 14 are preparatory to the calibration process. Personnel should become familiar with the applicable sections before beginning the calibration.

b. Items of equipment used in this procedure are referenced within the text by common name and item identification number as listed in tables 2 and 3. For the identification of equipment referenced by item numbers prefixed with A, see table 2, and for prefix B, see table 3.

WARNING

HIGH VOLTAGE is used or exposed during the performance of this calibration. DEATH ON CONTACT may result if personnel fail to observe safety precautions.

NOTE

Unless otherwise specified, verify the result of each test and, whenever the test requirement is not met, take corrective action before continuing with the calibration. Adjustments required to calibrate the TI are included in this procedure. Additional maintenance information is contained in the manufacturer's manual for this TI.

NOTE

Unless otherwise specified, all controls and control settings refer to the TI.

14. Equipment Setup

a. Connect TI to autotransformer (A2).

b. Connect autotransformer to 115 V ac and adjust for 115 V ac output.

c. Energize TI and allow at least 20 minutes to warm up and stabilize.

d. Deenergize TI and wait 30 seconds. If meter pointer does not indicate 0, adjust mechanical zero for 0 indication.

e. Energize TI.

15. Dc Voltage

a. Performance Check

(1) Set FUNCTION switch to +DCV and RANGE switch to .5V.

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(2) Connect DCV probe and COM lead together. If TI meter does not indicate 0, perform b(1) and (2) below.

(3) Set FUNCTION switch to -DCV. If TI meter does not indicate 0, perform b(3) below.

(4) Set RANGE switch to each range. Zero offset will not exceed ±1 percent of full scale for any range.

(5) Set FUNCTION switch to +DCV and repeat technique of (4) above.

(6) Set RANGE switch to .015V.

(7) Connect DCV probe and COM lead to dc voltage standard (A5).

(8) Adjust dc voltage standard for a full scale indication on TI. If dc voltage standard does not indicate between 0.01470 and 0.01530 V, perform b(4) and (5) below.

(9) Adjust autotransformer (A2) between 105 and 125 V, and repeat (8) above.

(10) Adjust autotransformer to 115 V and repeat technique of (8) above, using settings listed in table 7. If dc voltage standard does not indicate within limits specified, set dc voltage standard to nominal value and perform adjustments listed in table 7 for full scale indication on TI.

Table 7. Dc Voltage and Tracking

Test instrument		Dc voltage standard indications (V)		Adjustments (fig. 3) (R)
RANGE switch settings	Indications (V)	Min	Max	
.05V	0.05	0.0490	0.0510	R18
.15V	0.15	0.1470	0.1530	R18
.5V	0.5	0.490	0.510	R30
1.5V	1.5	1.470	1.530	R30
5V	5.0	4.90	5.10	R30
5V	3.0	2.90	3.10	---
5V	1.0	0.90	1.10	---
15V	15.0	14.70	15.30	R30
50V	50.0	49.0	51.0	R30
150V	150.0	147.0	153.0	R30
500V	500.0	490.0	510.0	R30
1500V	1000.0	970.0	1030.0	R30

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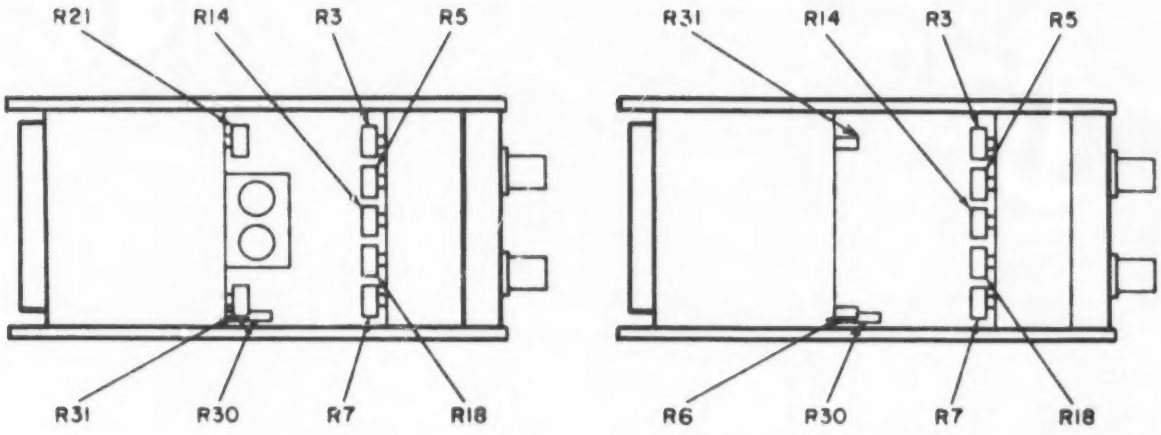

Figure 3. Adjustment locations - top view.

b. Adjustments

(1) Adjust R21 (fig. 3) fully ccw, then adjust approximately 20 degrees cw (only SN 0982A22438 and below) (R).

(2) Adjust ZERO ADJ (rear of TI) for 0 meter deflection (may not appear on TI below SN 550).

(3) Adjust ZERO ADJ to return meter pointer halfway back to 0. For SN 0982A22439 and above, adjust R6 (fig. 3) until TI meter indicates 0 with FUNCTION switch in both +DCV and -DCV positions.

(4) Adjust dc voltage standard output to 0.0150 V.

(5) Adjust R18 (fig. 3) for 0.015-V indication on TI (R).

NOTE

R18 affects all ranges and R30 affects ranges above 0.15 V. Because of interaction, adjustment of R18 and R30 may have to be repeated until TI voltage indications are within specified limits.

16. Ac Voltage

a. Performance Check

(1) Set TI controls as listed in (a) through (c) below.

(a) FUNCTION switch to ACV.
(b) RANGE switch to .5V.

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(c) AC ZERO control to center of its rotation.

(2) Connect AC PROBE and COM lead together. If TI meter does not indicate 0, perform b(1) and (2) below.

(3) Connect AC PROBE and COM lead to ac calibrator (A1) using adapter box and cable (B4 and B5).

(4) Adjust ac calibrator frequency for 400 Hz and output for a full scale indication on TI. If ac calibrator does not indicate between 0.4850 and 0.5150 V ac, perform b(3) and (4) below.

(5) Repeat technique of (4) above, using settings listed in table 8. If ac calibrator does not indicate within limits specified, set ac calibrator to nominal value and perform adjustments listed in table 8 for full scale indication on TI.

Table 8. Ac Voltage

Test instrument		Ac calibrator indications (V ac)		Adjustments (fig. 3) (R)
RANGE switch settings	Indications (V ac)	Min	Max	
1.5V	1.5	1.4550	1.5450	R5
5V	5	4.850	5.150	R7
15V	15	14.550	15.450	R14[1]
50V	50	48.50	51.50	R14
150V	150	145.50	154.50	R14
500V	300	285.0	315.0	R14

[1]Adjust R14 for RANGE settings of 15 to 500 V ac. Select R14 compromise setting which will provide best overall results for these ranges.

b. Adjustments

(1) Adjust R31 (fig. 3) for 0 indication on TI (R).

(2) Fine adjust AC ZERO for 0 indication on TI.

(3) Adjust ac calibrator for a 0.5-V indication.

(4) Adjust R3 (fig. 3) for a 0.5-V indication on TI (R).

17. Frequency Response

a. Performance Check

(1) Set RANGE switch to .5V.

(2) Connect AC PROBE and COM leads together and adjust AC ZERO for 0 indication on TI.

(3) Connect AC PROBE and COM lead to test oscillator (A12) 50 ohm output, using adapter and termination (B1 and B8).

(4) Adjust test oscillator frequency for 400 Hz and amplitude for .3 V as indicated on TI.

(5) Set test oscillator EXPAND/NORMAL switch to EXPAND and adjust REF SET for 0 indication on test oscillator.

(6) Adjust test oscillator frequency to 20 and 100 Hz. Adjust amplitude to maintain 0 indication on test oscillator. TI will indicate between .25 and .35 V.

(7) Adjust test oscillator frequency to 10 kHz, 100 kHz, 1 MHz, and 10 MHz while adjusting amplitude to maintain a .3 V indication on TI. Test oscillator will remain within ±2 percent on expand scale.

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(8) Adjust test oscillator frequency for 10 MHz and amplitude for 0 indication on test oscillator. Record TI indication.

(9) Connect equipment as shown in figure 2.

(10) Adjust signal generator (A11) frequency for 10 MHz and amplitude for same TI indication as recorded in (8) above. Record digital voltmeter (A7) indication.

(11) Adjust signal generator for 30, 50, and 100 MHz while maintaining digital voltmeter indication recorded in (10) above. TI will indicate between .29 and .31 V for 30 and 50 MHz; .28 and .32 V for 100 MHz.

b. Adjustments. No adjustments can be made.

18. Resistance

a. Performance Check

(1) Set FUNCTION switch to OHMS and RANGE switch to RX10M.

(2) Adjust OHMS ADJ (rear of TI) for meter indication.

(3) Connect DCA OHMS and COM leads together and adjust ZERO ADJ (rear of TI) for 0 meter indication.

(4) Separate DCA OHMS and COM leads.

(5) Repeat (2) through (4) above until no further adjustments are necessary.

(6) Connect DCA OHMS and COM leads to resistance standard (A9).

(7) Set RANGE switch to RX10.

(8) Adjust resistance standard for 10 ohms indication on TI. Resistance standard will indicate between 9.5 and 10.5 ohms.

(9) Repeat technique of (7) and (8) above, using settings listed in table 9. Resistance standard indications will be within limits specified.

Table 9. Resistance

Test instrument		Resistance standard indications	
RANGE switch settings	Indications (OHMS scale)	Min	Max
RX100	1	95 Ω	105 Ω
RX1K	1	950 Ω	1050 Ω
RX10K	1	9.5 kΩ	10.5 kΩ
RX100K	1	95 kΩ	105 kΩ
RX1M	1	.95 MΩ	1.05 MΩ
RX10M[1]	1	9.5 MΩ	10.5 MΩ

[1]Connect resistance standard (A10) in series with resistance standard (A9), using lead (B7).

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b. Adjustments. No adjustments can be made.

19. Dc Current

a. Performance Check

(1) Set FUNCTION switch to +DCA and RANGE switch to 150 MA.

(2) Connect equipment as shown in figure 4.

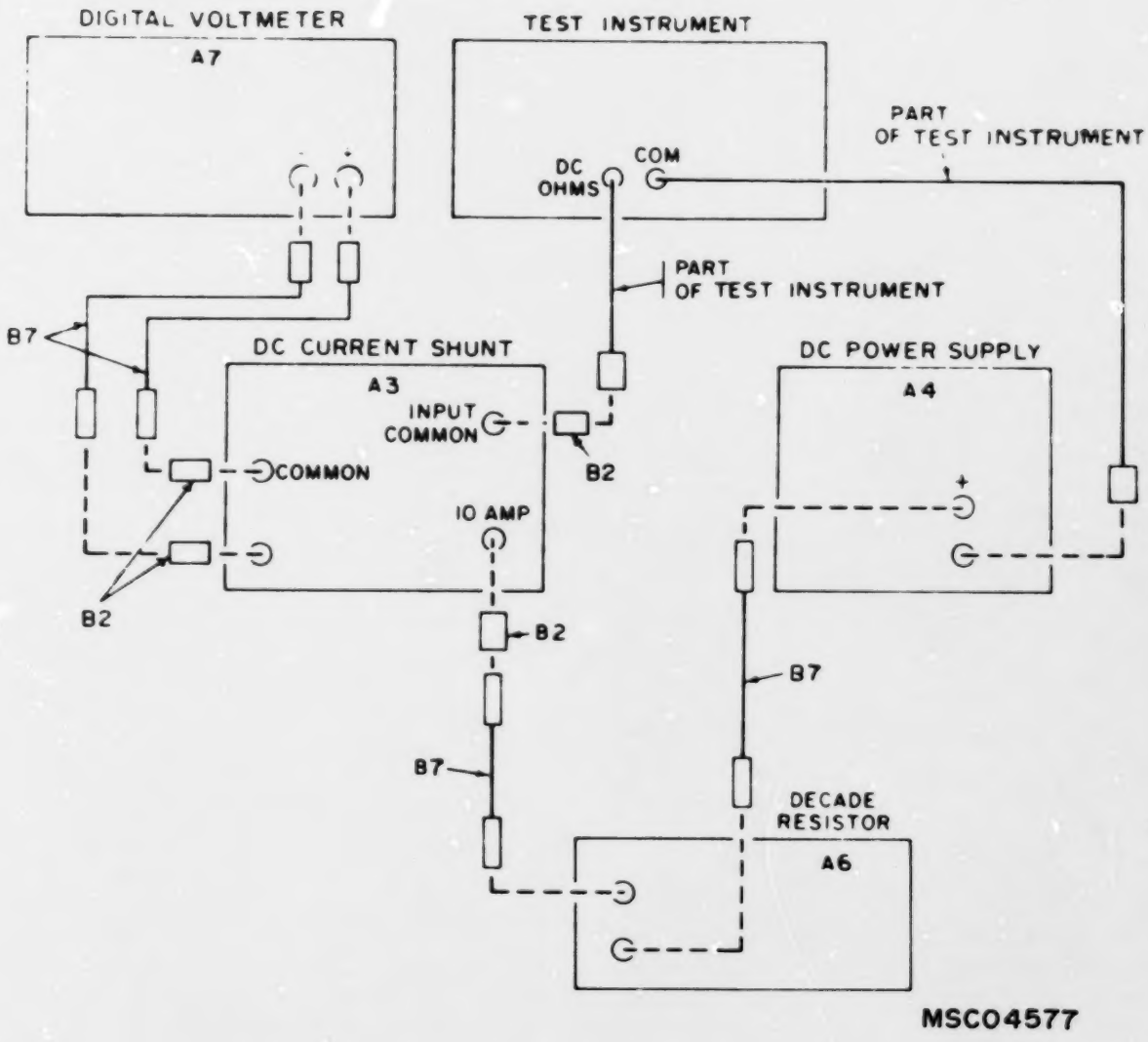

Figure 4. Dc current - equipment setup.

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(3) Set dc current shunt (A3) range plugs to 1 AMPERES position.

(4) Adjust dc power supply (A4) and decade resistor (A6) for TI indication of 150 mA. Digital voltmeter (A7) will indicate between 14.55 and 15.45 mV dc.

(5) Repeat technique of (3) and (4) above, using settings listed in table 10. Digital voltmeter will indicate within limits specified.

b. Adjustments. No adjustments can be made.

Table 10. Dc Current

Current shunt range positions (A)	Test instrument range and meter indications	Digital voltmeter indications (mv dc)	
		Min	Max
.1	50 MA	48.5	51.5
.1	15 MA	14.55	15.45
.01	5 MA	48.5	51.5
.01	1.5 MA	14.55	15.45
.001	.5 MA	48.5	51.5
.001	150 µA	14.55	15.45
.0001	50 µA	48.5	51.5
.0001	15 µA	14.55	15.45
.00001	5 µA	48.5	51.5
.00001	1.5 µA	14.55	15.45

20. Final Procedure

a. Deenergize and disconnect all equipment and reinstall protective cover on TI.

b. When all parameters are within tolerance, annotate and affix DA Label 80 (US Army Calibrated Instrument). When the TI receives limited or special calibration, annotate and affix DA Label 163 (US Army Limited or Special Calibration). When the TI cannot be adjusted within tolerance, repair the TI in accordance with the maintenance manual. When repair is delayed for any reason or the TI cannot be repaired with local resources, annotate and affix DA Form 2417 (US Army Calibration System Rejected Instrument) and inform the owner/user accordingly in accordance with TB 750-25-1.

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

DON J. DELANDRO
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